

IN RE APPLICATION OF:	§	ATTY. DOCKET NO.:	AUS920010135US1
	§		
ELMOOTAZBELLAH NABIL	§	EXAMINER:	JINSONG HU
ELNOZAHY	§		
	§		
SERIAL NO.:	§	CONFIRMATION NO.:	9849
09/935,414	§		
	§		
FILED:	§	ART UNIT:	2154
AUGUST 23, 2001	§		
	§		
FOR:	§		
WEB SERVER ARCHITECTURE	§		
FOR IMPROVED	§		
PERFORMANCE	§		

09/935,414

REAL PARTY IN INTEREST

The real party in interest in the present Application is International Business Machines Corporation, the Assignee of the present application as evidenced by the Assignment set forth at reel 012130, frame 0708.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, the Appellants' legal representative, or assignee, which directly affect or would be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1-2, 5-10 and 14-23, which comprise all pending claims, stand finally rejected by the Examiner as noted in the Advisory Action dated August 29, 2006. The rejection of Claims 1-2, 5-10 and 14-23 is appealed.

STATUS OF AMENDMENTS

Appellants' Amendment C, filed on June 1, 2006, was entered by the Examiner, as noted in the Final Office Action.

SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' Claim 1 recites a web server. As described, *inter alia*, at page 4, line 29 *et seq* and illustrated at **Figure 2**, reference numerals **200-220**, the web server includes a user space and an operating system space. As described, *inter alia*, at page 4, line 29, *et seq* and illustrated at **Figure 2**, reference numeral **204**, the web server includes an application level interpreter configured to process a client request. As described, *inter alia*, at page 4, line 29, *et seq* and illustrated at **Figure 2**, reference numeral **202**, the web server includes at least one kernel extension device driver enabling the application level interpreter to communicate with a network interface to receive the client request. As described, *inter alia*, at page 4, line 29, *et seq* and illustrated at **Figure 2**, reference numeral **206**, the web server includes a transmission protocol library, including TCP/IP library routines, which enable the web server to process the client request and corresponding response within the user space.

Appellants' Claim 9 recites a web server. As described, *inter alia*, at page 1, line 20, *et seq* and illustrated at **Figure 1**, generally shown as web server 110, the web server includes a processor, memory, and input means. As described, *inter alia*, at page 6, line 1 *et seq* and illustrated at **Figure 2**, reference numerals 201 and 221, the web server includes a dedicated network interface and a general purpose network interface. As described, *inter alia*, at page 4, line 29 *et seq* and illustrated at **Figure 2**, reference numeral 204, the web server includes a user space application level interpreter configured to process a client request. As described, *inter alia*, at page 4, line 29, *et seq* and illustrated at **Figure 2**, reference numeral 202, the web server includes a user space kernel extension device driver enabling the application level interpreter to communicate with the dedicated network interface to receive the client request. As described, *inter alia*, at page 4, line 29, *et seq* and illustrated at **Figure 2**, reference numeral 206, the web server includes a user space TCP/IP protocol stack that enables the web server to perform network processing of the client request and a corresponding response with the user space.

Appellants' Claim 17 recites a computer program product. As described, *inter alia*, at page 7, line 14 *et seq* and illustrated at **Figure 4**, reference numerals 404, the computer program product includes instructions for mapping a network interface to the user space of a web server application. As described, *inter alia*, at page 7, line 14, *et seq* and illustrated at **Figure 4**, reference numeral 410, the computer program product includes instructions within the web server application user space for processing the network packet. As described, *inter alia*, at page 7, line 14, *et seq* and illustrated at **Figure 4**, reference numeral 412, the computer program product includes instructions within the web server application user space for interpreting an application layer header of the network packet. As described, *inter alia*, at page 7, line 14, *et seq* and illustrated at **Figure 4**, reference numerals 420-424, the compute program product includes instructions for generating a response to the network packet including a user space code means for retrieving an HTML file, user space code means for executing a perl script, and user space code means for executing a Java servlet wherein the instruction for processing the network packet includes a user TCP/IP protocol stack.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. The Examiner's rejection of Claims 1-2, 5-10 and 14-23 under 35 U.S.C. §103(a) as being unpatentable over *Deily et al.* (U.S. Pub. No. 2004/0044760) (hereinafter *Deily*) is to be reviewed on Appeal.

- B. The Examiner's rejection of Claims 8 and 16 under 35 U.S.C. §103(a) as being unpatentable over *Deily et al.* (U.S. Pub. No. 2004/0044760) in view of "Official Notice" is to be reviewed on Appeal. In view of the dependency of Claims 8 and 16 on Claims 1 and 14, respectively, the disposition of the rejection of Claims 1-2, 5-10, and 14-23 will be determinative of the appeal of the rejections of Claims 8 and 16.

- C. The Examiner's rejection of Claims 21-23 under 35 U.S.C. §103(a) as being unpatentable over *Deily et al.* (U.S. Pub. No. 2004/0044760) in view of *Lin et al.* (U.S. Patent No. 6,272,522) is to be reviewed on Appeal. In view of the dependency of Claims 21-23 on Claim 17, the disposition of the rejection of Claims 1-2, 5-10, and 14-23 will be determinative of the appeal of the rejections of Claims 21-23.

ARGUMENT

A. The rejection of Claims 1-2, 5-10 and 14-23 under 35 U.S.C. §103(a) as being unpatentable over *Deily* is not well founded and should be reversed.

1. General requirements for a rejection under 35 U.S.C. § 103

As set forth in the M.P.E.P. § 2142, “[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The rejection of Claims 1-2, 5-10, and 14-23 under 35 U.S.C. § 103(a) as being unpatentable over *Deily* set forth at page 2 of the Final Office Action dated August 29, 2006 fails the first prong of the test. At page 3 of the Final Office Action, Examiner concedes that “*Deily* does not specify that the TCP/IP library is in the user space.” Examiner nevertheless asserts, “it would have been obvious . . . to include a TCP/IP library in user space, because doing so would improve the integrity of the system by keeping the request processing module and the protocol library in the same place.” For the reasons detailed below, Appellants submit that the Examiner’s rejection under § 103(a) as unpatentable over *Deily* is not well founded and should be reversed.

2. Insufficient evidence of a motivation to modify the *Deily* reference is presented.

With respect to exemplary Claim 1, Examiner’s proposed modification of *Deily* to place a TCP/IP library in user space on the basis of alleged *common knowledge* does not render obvious Appellants’ invention because the proposed combination lacks sufficient evidence of motivation or suggestion to alter the reference in the manner suggested by Examiner, which motivation or suggestion is a necessary prerequisite for the proposed combination to render Appellants’ invention obvious. M.P.E.P. § 2143. In evaluating motivation or suggestion to combine reference teachings, “a prior art reference must be considered in its entirety, i.e., as a whole”

(emphasis in original). M.P.E.P. § 2141.02, citing *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983) *cert. denied*, 469 U.S. 851 (1984).

When taken as a whole, Examiner alleges that *Deily* discloses a web server architecture with a TCP/IP library in kernel space (2/23/06 Office Action at paragraph 5), but nevertheless asserts, “it would be obvious to a person of ordinary skill in the art at the time the invention was made to including [sic] a TCP/IP library in user space.” In view of the teachings of the references when taken as a whole, it is apparent that there is no objective suggestion or motivation in the cited references (or generally in the art) that would lead a skilled artisan to modify the reference teachings to obtain *the present invention*. It is incumbent upon the Examiner to show, not merely that the alteration of the references might be advantageous, but to show that the prior art disclosed some teaching, suggestion, or incentive to make the combination made by the inventor. *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 930, 15 USPQ2d 1321 (Fed. Cir. 1990). Instead, at paragraph 21, the Examiner merely asserts:

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to including a TCP/IP library in user space because doing so would improve the integrity of the system by keeping the request processing module and the protocol library in the same space.

While the expectation of an advantage, such as the general enhancement to *Deily* relied upon by the Examiner, can in some cases provide motivation to combine references, such a motivation is not facially adequate where the references do not teach the alteration of the reference to achieve the features recited in Appellants’ claim. The cited passages in *Deily* do generally discuss a web server architecture, but the cited passages would not lead one skilled in the art to modify *Deily* to improve the integrity of the system by keeping the request processing module and the protocol library in the same space. If the motivation to improve the integrity of the system in this manner had been in *Deily*, Examiner could have cited the passages by column and line number. If, as the Examiner has suggested, such a teaching existed in the *common knowledge* available to one skilled in the art, Appellants do not doubt that the Examiner would have easily found such a reference and cited it. Appellants believe that the Examiner has failed to establish a *prima facie* case of obviousness.

In response to Appellants' argument that no evidence supports the propose modification to *Deily* to place the TCP/IP library and stack in user space, Examiner cites *Berg, et al.* (U.S. Patent Publication Number 2001/0044904), (hereinafter "*Berg*") on page 5 of the Final Office Action. *Berg* was published on November 22, 2001. The present application was filed on August 23, 2001, a full three months before *Berg* was published and invented well before *Berg*'s publication date. Thus, *Berg* cannot provide that the proposed modification of *Deily* was well known in the art at the time the present invention was made. Consequently, the additional citation to *Berg* cannot supply the deficiency of *Deily* to render exemplary Claim 1 obvious.

3. *Deily* teaches away from the claimed invention.

Appellants further respectfully traverse the Examiner's assertion of obviousness, because the reference cited by the Examiner teaches away from the features described in Appellants' claim. It is settled law that the fact that an inventor proceeded contrary to the accepted wisdom of the prior art is "strong evidence of nonobviousness". *W.L. Gore & Associates, Inc. v. Garlock, Inc.* 721 F.2d 1540, 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983). In spite of this well-settled doctrine of law, the Examiner presents *Deily*, which embodies the conventional wisdom in design of the relevant systems, and then asserts that *common knowledge* would motivate modification of *Deily* to create a system that is designed in a contrary manner.

Deily describes a kernel-based "listener" service. Referring to Figure 4 of *Deily*, it is readily apparent that *Deily* teaches a web server in which novel code (the Universal listener 402) is incorporated into the kernel space. *Deily* reports that doing so reduces the number of user mode "service hops" that occur later (see, e.g., paragraph 60 of *Deily*). Thus, *Deily* teaches adding code to the kernel space for the purpose of reducing the number of user mode context switches.

In direct contrast to the clear teaching of *Deily*, Claim 1 recites that code is incorporated into the user space, so that the user space web server can process web requests within the user space (i.e., without invoking the kernel). Specifically, Claim 1 recites the inclusion of user space TCP/IP libraries that enable the web server (which is a user space application) to process client requests.

Referring back to Figure 4 of *Deily*, the TCP/IP library of *Deily* is clearly part of the kernel. As the Examiner has acknowledged, there is no teaching or suggestion in *Deily* to incorporate TCP/IP code 202 into the user space because *Deily* is concerned with adding functionality to the kernel as a means for reducing user mode context switches. Thus, *Deily* teaches incorporating more code into the kernel space, while Appellants' Claim 1 emphasizes a conceptually opposed design for locating code in the user space. One having the benefit of *Deily* would not be motivated to incorporate a TCP/IP library into user space, because *Deily* describes a system that is designed to reduce the amount of processing handled in user space. Because the cited reference teaches away from Applicants' invention, Appellants believe that the examiner has failed to establish a *prima facie* case of obviousness and that the rejection should be reversed.

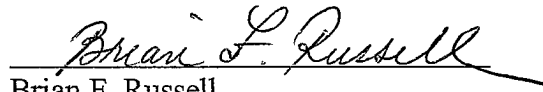
4. The modification suggest by the Examiner would render *Deily* unsuitable for its intended purpose.

Moreover, Appellants respectfully submit that there is no suggestion or motivation to make a modification to the prior art that "would render the prior art invention being modified unsatisfactory for its intended purpose." M.P.E.P. § 2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)). As described above, the intended purpose of *Deily* is to reduce the amount of processing handled in user space. The Examiner's modification of *Deily* "to include[e] a TCP/IP library in user space . . . [to] improve the integrity of the system by keeping the request processing module and the protocol library in the same space" would frustrate the very purpose for which the *Deily* reference was designed. Consequently, the Examiner's proposed modification of *Deily* would not be obvious to those skilled in the art, and the rejection under 35 USC § 103 should be reversed.

B. CONCLUSION

Appellants have pointed out with specificity the manifest error in the Examiner's rejections, and the claim language which renders the invention patentable over the various combinations of references. Appellants, therefore, request that rejections of all pending claims be reversed.

Respectfully submitted,



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CLAIMS APPENDIX

1. A web server having a user space and an operating system space, wherein the user space includes:

an application level interpreter configured to process a client request;
at least one kernel extension device driver enabling the application level interpreter to communicate with a network interface to receive the client request; and
a transmission protocol library, including TCP/IP library routines, enabling the web server to process the client request and corresponding response within the user space.

2. The server of claim 1, wherein the interpreter comprises an HTTP interpreter.

3-4. (canceled)

5. The server of claim 1, wherein the library includes only those routines necessary for processing of requests to and responses from the interpreter.

6. The server of claim 1, wherein the web server includes a user space file cache.

7. The server of claim 1, wherein the web server is configured to initiate multiple threads within its user space responsive to user requests.

8. The server of claim 7, wherein the threads include threads selected from the group of threads including perl scripts, cgi threads, and Java servlets.

9. A web server comprising:
processor, memory, and input means;
a dedicated network interface and a general purpose network interface;
a user space application level interpreter configured to process a client request;
user space kernel extension device drivers enabling the application level interpreter to communicate with the dedicated network interface to receive the client request; and

a user space TCP/IP protocol stack enabling the web server to perform network processing of the client request and a corresponding response within the user space.

10. The server of claim 9, wherein the interpreter comprises an HTTP interpreter.

11-13. (canceled)

14. The server of claim 9, wherein the web server includes a user space file cache.

15. The server of claim 9, wherein the web server is configured to initiate multiple threads within its user space responsive to user requests.

16. The server of claim 15, wherein the threads include threads selected from the group of threads including perl scripts, cgi threads, and Java servlets.

17. A computer program product comprising computer executable instructions, residing on a computer readable medium, for processing client requests in a data processing server, the instructions comprising:

instructions for mapping a network interface to the user space of a web server application;

instructions within the web server application user space for processing the network packet;

instructions within the web server application user space for interpreting an application layer header of the network packet; and

instructions for generating a response to the network packet including user space code means for retrieving and HTML file, user space code means for executing a perl script, and user space code for executing a Java servlet wherein the instructions for processing the network packet comprise a user space TCP/IP protocol stack.

18. (canceled)

19. The computer program product of claim 17, wherein the instructions for interpreting the application layer header comprises and HTTP interpreter.

20. (canceled)

21. The server of claim 1, wherein the web server is configured to poll the network interface periodically.

22. The server of claim 9, wherein the web server is configured to poll the network interface periodically.

23. The computer program product of claim 17, further comprising instructions for polling the network interface to determine the arrival of a network packet.

EVIDENCE APPENDIX

Other than the Office Action(s) and reply(ies) already of record, no additional evidence has been entered by Appellants or the Examiner in the above-identified application which is relevant to this appeal.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings as described by 37 C.F.R. §41.37(c)(1)(x) known to Appellants, Appellants' legal representative, or assignee.